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TRAMWAY SYSTEMS
TRAMWAY TRACKS
TRAMWAY OVERHEAD WORK
TRAMWAY CARS AND EQUIPMENT
BRAKES AND BRAKE RIGGING
TRAMWAY MOTORS AND CONTROLLERS
DIRECT-CURRENT RAILWAYS
ALTERNATING-CURRENT RAILWAYS
ELECTRIC SIGNALLING ON RAILWAYS

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TRAMWAY SYSTEMS

CONSTRUCTION AND EQUIPMENT

DEVELOPMENT OF TRAMWAYS

HISTORICAL

1. Owing to the rapid growth of towns and cities, the economical and rapid transportation of passengers is a matter of great importance. In cities like London, Glasgow, and Manchester, the demand for travelling facilities during the hours when the people are going to or from their places of business is so great as to be almost impossible to meet. But the **electric tramways** have done much toward meeting this demand, especially for short distances; for distances greater than 4 or 5 miles, however, the steam and electric railways are preferred, because of the speed limitations of the tramways due to their running in the streets.

2. Early Tramways.—The first electric tramway was laid down by Messrs. Siemens & Halske at the Berlin Agricultural Exhibition in 1879. It consisted of a four-wheeled electric locomotive, drawing three small open cars that carried six passengers each. The locomotive was driven by means of a ring-wound geared motor, the current being collected from a central *third rail;* the two running rails acted as return conductors. It drew the train round a part of the Exhibition at a speed of 7 miles an hour.

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